REMARKS

Claims 1 and 3-18 are pending in this application. Claims 12-15 and 17-18 are presently withdrawn from consideration. By this Amendment, claim 1 is amended to include the features of original claim 2 to further distinguish from Okubo and Hutter. Further support for the amendments to claim 1 can be found in the specification at, for example, paragraph [0010]. Claim 1 is also amended to address antecedent basis issues and for matters of form. Claim 2 is canceled. Claims 3-12 and 14-18 are amended to address antecedent basis issues. No new matter is added.

Entry of the amendments is proper under 37 CFR §1.116 because the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not raise any new issue requiring further search and/or consideration as the amendments amplify issues previously discussed throughout prosecution; and (c) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the final rejection. Entry of the amendments is thus respectfully requested.

In view of the foregoing amendments and the following remarks, reconsideration and allowance of claims 1 and 3-18 are respectfully requested.

35 U.S.C. §103(a) Rejection

Claims 1-11 and 16 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Okubo (JP 11-061550) in view of Hutter (U.S. Patent No. 6,551,545). Applicants respectfully traverse this rejection.

Claim 1 requires, among other features:

(1) a first step of the cooling to be conducted in a first cooling zone and a second step of the cooling is conducted in a second cooling zone that is beneath the first cooling zone,

(2) wherein in the first cooling zone, the gaseous cooling medium is blown from a blowing device and a gaseous cooling medium flow is directed in such a way that it flows through the filament bundle transversely by sucking the gaseous cooling medium with a suction device after the gaseous cooling medium flows through the filament bundle,

(3) at least a portion of the filament bundle in the first cooling zone being disposed between the blowing device and the sucking device,

(4) wherein the gaseous cooling medium blown from the blowing device leaves the filament bundle substantially completely on a side opposite an inflow side, and

(5) wherein in the second cooling zone, the filament bundle is cooled further through self-suction of a gaseous cooling medium surrounding the filament bundle.

The above features of claim 1 provide effective cooling of extruded filaments, thereby producing filaments with improved homogeneity of physical properties over the cross section of the individual filaments. In this regard, a high degree of cooling is achieved as soon as possible after extrusion of the filaments in order to achieve rapid crystallization, thus obtaining filaments with little to no difference in crystallization behavior between the filament skin and the filament core. See, for example, paragraph [0008] of the specification.

The combination of Okubo and Hutter do not render obvious the above features or benefits of claim 1.

First Cooling Zone Differences

Okubo describes that the filaments are cooled first by blasting equipment 2 in such a way that the filaments do not completely solidify. The cooling medium is blown by the blasting equipment 2 from a single-side or sprayed annularly. See paragraph [0010] of Okubo. Thus, the filaments of Okubo will have a solidified skin, but the core of the filaments are not solidified in the first step. Thus, Okubo does not provide the benefits associated with claim 1

that produce filaments with improved homogeneity of physical properties over the cross section of the individual filaments.

In addition, Okubo has no suction equipment to prevent the cooling medium from traveling in a downward direction with the filaments after the cooling medium is blown on the filaments. Okubo describes that a down draft is formed along the transit direction of the filaments in the cooling dome 3. See paragraphs [0006] and [0011] of Okubo. Thus, when the blasting equipment 2 blows cooling medium on the filaments, the cooling medium of Okubo moves downward, and does not substantially completely leave the filament bundle on a side opposite the inflow side.

Okubo further describes that the down draft of cooling medium is blown from holes 11 attached to the upper part of cooling dome 3 blowing cooling medium in a downward direction, thus further increasing the amount of cooling medium that travels with the filaments and not substantially completely leaving the filament bundle on a side opposite the inflow side. See paragraph [0011] and Fig. 4 of Okubo. Thus, because the down draft is formed in Okubo, Okubo also does not describe that the cooling medium flows through the filament bundle transversely.

Thus, Okubo does not describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, the gaseous cooling medium flow being directed in such a way that it flows through the filament bundle transversely by sucking the gaseous cooling medium with a suction device after the gaseous cooling medium flows through the filament bundle, and wherein the gaseous cooling medium blown from the blowing device leaves the filament bundle substantially completely on a side opposite an inflow side.

Further, Okubo does not describe or provide any reason or rationale for one of ordinary skill in the art to have come to, at least a portion of the filament bundle in the first

cooling zone being disposed between the blowing device and the sucking device, as required by amended claim 1.

Hutter does not remedy the deficiencies of Okubo. As shown in Fig. 1 of Hutter, the cooling shaft 5 is arranged downstream of the spin head 1, and surrounds the filaments 8 with a gas permeable wall 9. A blower 28, as shown in Fig. 2 of Hutter, blows coolant through the cooling shaft 5 and the cooling air surrounds the filaments. See col. 6, line 60 to col. 7, line 2 and Fig. 2 of Hutter.

Thus, Hutter does not describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, the gaseous cooling medium flow being directed in such a way that it flows through the filament bundle transversely by sucking the gaseous cooling medium with a suction device after the gaseous cooling medium flows through the filament bundle, and wherein the gaseous cooling medium blown from the blowing device leaves the filament bundle substantially completely on a side opposite an inflow side and at least a portion of the filament bundle in the first cooling zone being disposed between the blowing device and the sucking device.

Second Cooling Zone Differences

Claim 1 requires a second step of cooling that is performed in a second cooling zone that is beneath the first cooling zone. The second step of claim 1 is "passive" and does not require the use of any blowing or suction equipment. In the second cooling zone, the filament bundle is cooled further through self-suction of the gaseous cooling medium surrounding the filament bundle. The self-suction is created by the movement of the filament bundle.

The Patent Office admits that Okubo does not describe a second cooling zone wherein filaments are cooled through self-suction of a cooling medium. Okubo describes that active blowing is used in both steps. Further, because Okubo uses a same cooling medium in both steps, it does not matter if the cooling medium in the first step does not substantially

completely leave the filament bundle because the cooling medium just travels down along the fiber, to the second cooling zone, where additional cooling medium is introduced.

The Patent Office alleges that Hutter remedies this deficiency of Okubo.

Hutter describes that the coolant stream in the tension zone (allegedly equivalent to the second cooling zone of claim 1) may be generated from the coolant leaving the cooling zone and from a coolant supplied in the inlet area downstream of the cooling zone. See col. 3, lines 11-4. Hutter describes that the coolant stream is accelerated to at least a flow velocity that equals the speed of the advancing filaments so that the filaments are not decelerated in their advancing movement. See col. 3, lines 4-10 of Hutter. Hutter describes that due to a vacuum and self-suction, an airstream is sucked from the outside through the air intake 33 into the cooling zone 4. Hutter describes that to generate a coolant stream, the coolant is blown into the cooling zone and then guided into the tension zone or coolant is blown directly into the tension zone. Hutter is thus clearly using a blowing device or vacuum in the tension zone to supply additional coolant.

Hutter thus does not describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, the feature of claim 1 that requires the second "passive" cooling step where the filament bundle is cooled further through self-suction of a gaseous cooling medium surrounding the filament bundle. Hutter thus does not remedy the deficiencies of Okubo.

If Combined, Okubo And Hutter Do Not Render Claim 1 Obvious

Even if one of ordinary skill in the art would have combined Okubo and Hutter, it would not render claim 1 obvious.

In Okubo, as described above, a large part of the cooling medium blown against the filament bundle in the first cooling zone will travel downward with the filament bundle (due to self-suction) unless specific measures are taken to prevent this. However, Okubo does not

describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, a gaseous cooling medium flow being directed in such a way that it flows through the filament bundle transversely by sucking the gaseous cooling medium with a suction device after the gaseous cooling medium flows through the filament bundle.

Further, In Okubo, in the case where the cooling medium is sprayed annularly in the first cooling zone, the cooling medium has no other option than traveling downward into the second cooling zone. Okubo then uses additional cooling medium blown into the cooling cylinder in the second cooling zone. Thus, the cooling medium of Okubo clearly does not leave the filament bundle substantially completely on a side opposite an inflow side.

As described above, Hutter also describes that the coolant stream in the tension zone (allegedly equivalent to the second cooling zone of claim 1) may be generated from the coolant leaving the cooling zone and from a coolant supplied in the inlet area downstream of the cooling zone.

Thus, even if Hutter is combined with Okubo, the cooling medium from the first cooling zone would travel downward with the filament bundle and additional cooling medium would be actively blown/sucked into the second cooling zone.

Thus, even if combined, Okubo and Hutter would not render obvious the gaseous cooling medium blown from the blowing device leaves the filament bundle substantially completely on a side opposite an inflow side (in the first cooling zone), and wherein in the second cooling zone, the filament bundle is cooled further through self-suction of a gaseous cooling medium surrounding the filament bundle, as required by claim 1.

None Of The References Render Obvious At Least
A Portion Of The Filament Bundle In The First Cooling
Zone Being Disposed Between A Blowing Device And A Suction Device

Claim 1 requires that at least a portion of the filament bundle in the first cooling zone be disposed between the blowing device and the sucking device.

None of the cited references describe both a blowing device and a suction device in a first cooling zone. Thus, the combination of references does not describe, or provide any reason or rationale for one of ordinary skill in the art to have come to, at least a portion of the filament bundle in the first cooling zone being disposed between the blowing device and the sucking device.

Conclusion

In view of the above, the combination of Okubo and Hutter does not render all of the features of claim 1 obvious.

Claims 3-11 and 16 depend from claim 1. For at least their respective dependency, and for the additional features recited, Okubo and Hutter do not render obvious claims 3-11 and 16.

Withdrawal of the rejection is respectfully requested.

Rejoinder

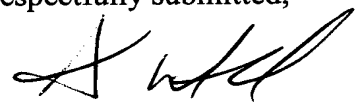
Applicants respectfully request rejoinder of claims 12-15 and 17-18, upon allowance of claims 1, 3-11 and 16.

Concluding Remarks

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1 and 3-18 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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